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ABSTRACT

This paper begins by arguing that access to education for those who do not attend classes on campus can be a question of their access to technology, i.e., the higher (or more exotic) the technology, the fewer the students who have means to use it. Almost universal access via the postal service is discussed in terms of speed, as compared with two-way live audio and video television communication with facsimile or computer file transfer for written work. A move to use existing and less expensive technologies is advocated as a parallel to innovation in the use of the newest technologies by distance education units. An example of such a parallel communication plan is provided by a description of the use of low-cost technology by the Extended Learning Institute (ELI) of Northern Virginia Community College, which currently uses cable and broadcast television, audio conferencing, fax, a compressed video network connecting its five campuses, telephone, and voice mail to communicate with students on administrative and instructional issues. This paper focuses on four technologies: computer conferencing, voice mail, audio conferencing, and locally-produced video. A brief review of each technology and its advantages and disadvantages precedes a description and discussion of its use at ELI. It is concluded that the use of these ordinary, relatively low-cost, and readily accessible technologies can speed the rate of communication, increase its quality, and make it possible for faculty to improve the learning experiences of their students. (BBM)

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Advancing Distance Education Programs with Ordinary Technologies

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ADVANCING DISTANCE EDUCATION PROGRAMS WITH ORDINARY TECHNOLOGIES

The use of ordinary, relatively low-cost, and readily accessible technologies provides administrators, designers and faculty efficient communication tools for distance education. Voice mail, computer conferencing, audio conferencing, and locally produced video can enhance the quality and speed the rate of communication for distant learners and faculty. The latest, exotic and, quite often, most expensive technologies are the focus of most conference presentations, professional publications, and the popular press as they represent future, and often increased, capabilities for distance education. Course design and administration benefits from a combination of both kinds of technologies and this paper focuses on the use of ordinary information technologies.

Communication or information technology has been at the center of discussion of distance education from the earliest correspondence courses to the present use of satellite communication. Ease of use, speed and access are crucial in the design and administration of instruction. The provision of access to courses for those who are not served by campus-based instruction is the traditional role of distance education. The efficient execution of this role is affected by the speed of communication; increasing the rate of transmission has been the goal of many in distance education so that students and faculty can carry on a dialogue about the course subject matter.

Increasingly, access to education for those who do not attend classes on campus can be a question of their access to technology. The higher - or at least the more exotic - the technology, the fewer the students who have a means to use it. The postal service provides access for almost all students in the form of a postal address, making the U. S. Mail a universal and inexpensive medium of communication. It is a medium that can be used without traveling from home, without the purchase of exotic equipment, and without the need to learn how to use new technologies. Students have access and know how to use this technology, and almost all forms of distance education use printed materials relying on the postal service for the exchange of messages.

Speed, on the other hand, is not the postal service's major asset. Two weeks is a common time frame for the submission of written work, its grading, and the return of it with the instructor's comments. Two way live audio and video television communication, with facsimile or computer file transfer for written work, is obviously a more immediate communication system. While speed is its asset, its liability is its limited access because it currently requires students leaving their home, the procurement of televisions and other equipment, and user training for staff and students. Increasingly, distance education units are making the investment in the fastest and latest technology which gives them speed, but it sometimes costs them accessibility. While innovation in the use of the newest of technologies should continue, a parallel move to use existing and less expensive technologies can complement a distance education unit's communications plan.

This paper reports on Northern Virginia Community College, Extended Learning Institute's (ELI) use of low-cost technology as an example of these parallel communication

plans. In particular, it examines the use of computer conferencing, voice mail, audio conferencing, and locally-produced video. With a base of 85 courses and 45 faculty, ELI has made many attempts in its 15 years to improve communication with its 3000 students. At present it uses cable and broadcast television, audio conferencing, audio and video tape, print materials sent via the post office, computer conferencing, fax, a compressed video network connecting its five campuses, telephone, and voice mail to communicate with students on administrative and instructional issues.

COMPUTER CONFERENCING

Computer conferencing is a relatively inexpensive technology and student access to it is increasing. Asynchronous (not real time) computer conferencing can be an important distance education medium in that it provides excellent "broadcasting" capabilities; a message typed once can be distributed to many users with no extra effort. Computer conferencing makes a kind of "classroom discussion" possible for independent home study students, a discussion that is perhaps more thoughtful and more open than in the classroom; participants can take time to formulate contributions and word them carefully, and slower and shyer students have more of an opportunity to contribute. Computer conferencing also exercises students' general written communication skills.

Computer conferencing can be an expensive and inaccessible medium if it includes the purchase of a central computer with hardwired or modem-based terminals for participants. The software can be equally expensive and require much staff time to support. Finally, it can also require much time and effort for participants to learn to use the hardware and software and/or time and effort on the part of the administrators to make the conferencing system easy to use.

At ELI, with a very limited budget, we looked first at our College's existing academic mainframe computer. This computer was originally intended for use by instructors to teach programming and systems development to computer science students. Some use is still made of it for this purpose, but the migration of the computer industry to personal computers and local area networks left this computer underused. A student programmer-oriented operating system (MUSIC) with a rudimentary electronic mail application was already running on this computer. In addition, there were hardwired terminals in computer labs on each of our five campuses, and there were 16 telephone dial-up ports for connection by modem. All of the basic hardware and software needed for computer conferencing were already in place and being supported by the College's computer center. What made this technology affordable for ELI was that it was in place and the computer conferencing system could ride along with the College's other functions including existing terminals and dial-in ports.

To create a computer conference, ELI staff programmed a more user-friendly interface for the electronic mail software and a mechanism for public access to documents, created student and instructor accounts that defaulted to the computer conference upon log in, and wrote a detailed user manual. All of this was done simultaneously with, and in support of, development of a technical writing course that used computer conferencing as the primary communication medium. The proposal for this course by an instructor was the

driving force that initiated our experiment with computer conferencing. Creation of the computer conference required approximately two months of staff time distributed over an eight-month calendar period.

The technical writing course has been very successful over the past two years, and so has a psychology course begun a year ago. Students enrolling in these courses receive a course guide and a computer conferencing manual in the mail. The course guide describes written assignments that are to be posted to the computer conference. The manual tells students how to connect to the computer conference and how to write and post an introduction of themselves. Students are encouraged to view and comment on each other's assignments, and to work collaboratively when interests overlap. The instructors provide public comments on most assignments, but give grades privately. In their evaluations, most students say that the conference is easy to use (but limited in capabilities), and most appreciate the opportunity to see and learn from the work of others.

Students have the option of going to a computer lab on campus and using a terminal, or of using their own personal computer, modem, and telecommunications software to connect to the computer conference via the telephone; any personal computer and telecommunications software that can emulate a VT100 terminal can be used. Many of the students enrolling in the course use personal computers at home or at work to do their conferencing, but some travel to the campuses to use the terminals in the computer labs. Some effort was required to communicate to computer center and computer lab staff the needs and problems of distance learners and non-computer science majors. Since the ELI staff's idea of user-friendliness differed significantly from that of the computer center's staff, it was sometimes difficult to explain why certain features of the system were a problem and to get advice on how to circumvent them. There were frequent problems with the computer center's dial-in hardware, which had probably not been heavily used and debugged until our project began. Computer center and computer lab staff were oriented toward supporting daytime campus users rather than nighttime and weekend distance users. However, the computer center was quite interested in seeing the academic computer better used, and has made an effort to understand and support the needs of distance education.

In choosing to use a relatively old mainframe computer as the conference platform, ELI elected to use a centrally supported, multi-modem, mainframe computer with a line editor instead of a microcomputer based system with word wrap, block editing, and automatic reformatting functions. While the mainframe conference has its limitations, it does provide a full-screen format and the capability for uploading documents students create on their own word processors. This has proven sufficient for the short documents required of students in these courses and is an excellent means of communication among students and faculty.

Current ELI plans related to computer conferencing include easing our administrative load by using unenhanced electronic mail software and student accounts, training selected campus instructors to use computer conferencing to support classroom instruction, adding access to on-line library catalogs, adding computer-assisted instruction capabilities, and providing inexpensive modems through the College bookstores. All of these will be done with an eye toward minimal budgets and maximum access for students.

VOICE MAIL

Technology and electronic media have, in fact, made us "distance learners" and changed the ways in which we can communicate. What is important for teachers is how we use this technology to provide learning situations which are comparable to traditional classroom learning situations. This is particularly true for the foreign language teacher and learner.

In the Fall, 1990, we began to teach French through a distance learning television course. Students viewed the telecourse **French in Action** on the College cable TV network and sent in their written assignments by mail and fax, their oral assignments by personal audio cassettes. The provision of televised lessons was relatively inexpensive in that the College already had a cable tv channel and access was open to all who had cable tv or who could travel to one of the College's five learning resource centers to view the lessons on tape.

Immediately, evaluations from students as well as concerns from the foreign language profession made us look at more effective ways to deal with oral assignments. Students told us, that while they appreciated the flexibility of the TV course, what they missed was the interaction between teacher and student, the immediate answers to questions and more important, feedback on their oral production. This became a different form of access in that it required a faster communication method that what could be done via the mail. Two way television capabilities were not present over the College's cable tv channel.

At the same time, the foreign language profession was critical of distance learning programs because students in these programs did not develop adequate speaking skills. The National Council of State Supervisors of Foreign Languages, together with the American Council on the Teaching of Foreign Languages have developed guidelines (1990) for foreign language distance learning programs. These are to include live interaction between student and teacher, activities to provide for listening and speaking skills, and immediate individualized feedback on student oral performance.

The voice mail system, with a personal mailbox for the instructor and a personal mailbox for each student registered in the course, has enabled us to solve this access and speed problem. The system was originally set up on a 7-year old IBM PC compatible with limited memory and storage capacity. The voice mail board was commercially available and required some knowledge of computers to write the files necessary to set up the board and the computer. Currently a newer computer with a larger hard drive and more voice mail capabilities (total costs about $1000) is being used.

The voice mail system is being used in three different ways:

1. The instructor's personal mailbox serves as the means for students to ask questions and leave messages for the instructor, from asking about a difficult grammatical point, to the explanation that the baby has been sick or I will be out of town and my assignments will be a little late.

2. Students leave their weekly dialogues on the system and the instructor gives them immediate feedback on their oral production on their personal mail box. These dialogues range from the simple 10-line dialogue to a discussion of describing a vacation or arguing the advantages of TV publicity. These dialogues are designed to simulate telephone conversations.

3. As a means of developing listening comprehension skills, each week there is a listening comprehension quiz left on the voice mail system for students. Quizzes range from simple recognition of vocabulary and grammar from the text to understanding a message about the weather, movie schedules, or travel arrangements. These more complicated listening quizzes are intended to simulate daily, real-life situations of calling for information or calling to talk to a friend.

The advantages of the voice mail system have been many. It is economical to install and it is easy for students to use. Everyone has access to a telephone and students are used to making business calls, personal calls, and calls for information. The system is flexible and available when they need it. Students may call 24 hours a day, 7 days a week and, when their work schedule has taken them out of town, some have called in their dialogues from out of state.

From the instructor's point of view, there have been some unforeseen advantages. One has been the ability of the voice mail system to personalize the relationship between student and instructor so that the students in the distance learning class are known as well as students in traditional classes. Furthermore, the isolation of the student from the classroom has been helpful to a number of students by lowering the anxiety they might have experienced in speaking in front of an instructor and classmates. Several of them have said that they could not have achieved the level of speaking proficiency had they been in a traditional classroom setting. This is particularly true of adult learners who are returning to the classroom after a long absence.

AUDIO CONFERENCING

Audio conferencing is an inexpensive means of allowing students and faculty to converse without the need for anyone to commute to campus. Audio conferencing is a fully developed technology and one that the State of Virginia provides through a "meet me" phone bridge. At a prearranged time, students and faculty call a designated local phone number using their own telephones and connect with each other in a multi-party conversation. A phone bridge provides better conversation patterns than most conference call systems built into students' phones since more people can participate and switching between speakers is more natural. In Virginia, the arrangement of these conferences is extremely easy; it takes only telephone call to a central operator who designates a phone number and allots time to the audio conferees.

Examination reviews, homework help, oral practice in language classes, and other instructional applications are made possible with the phone bridge. Courses that are paced for group work can especially benefit from this technology because it allows for groups to

meet without driving to a campus. It does, however, require that everyone participate at the same time since this is a real-time telephone conversations. A tape delayed version of this conference can be made available for class members who do not participate in the live conversation, but they would not have the opportunity to contribute to the discussion. Similarly, since this is an audio conference no visual images are shown, but they can be sent in advance to conference participants so that all can refer to the same documents. Physical access to audio conferencing is almost total as most people have telephones and the speed of communication is instantaneous. Participation can be limited by students' and faculty members' busy schedules.

LOCALLY PRODUCED VIDEO

Finally, locally-produced videos can be used to capture discussions or meetings for show later time to other class members. These short video programs can be produced by the College or by students who have access to VHS camcorders. At ELI, the College's tv studio offers a quick means to capture visual images with accompanying audio and distribute them to students. Courses that rely heavily on printed material can be enhanced with 4-5 hours of video. These 4-5 hours are locally produced and usually feature the instructor presenting visual images or a dialogue that would not be as effective in print. Production is simple in that the College has a telecourse production studio that uses fixed cameras where the instructors switch between a head shot of themselves and a graphics camera of their handouts. The only required technician monitors the recording of the video in the studio's control room. ELI has used this for whole courses, for the 4-5 hours of supplementary video mentioned earlier, and for 3 hours of wrap-around video that accompanies telecourses licensed from PBS or other vendors.

The viewing of this video takes place on cable tv, at the campus learning resource centers, and through circulation of copies of the tapes. Production of video by students will increase as they get more access to camcorders and begin to use them to send in their assignments or other communications. Speeches, biology laboratory experiments, history field trips, and other such assignments can be easily recorded on a camcorder by students and submitted to instructors for review and feedback.

CONCLUSION

Ordinary, relatively low-cost, and readily accessible technologies are prime tools for distance education courses. While two-way audio and video may be a primary future technology, telephones, inexpensive computer connections, and locally produced video are tools that can be employed immediately in many colleges and universities. The communication facilities of most colleges, as in the case of NVCC, offer course administrators, designers and faculty readily available tools for distance education. Use of these in voice mail, computer conferencing, audio conferencing, and locally produced video can speed the rate of communication, increase its quality, and make it possible for faculty to improve the learning experiences of their students.